INVASIVE PLANTS = NPS POLLUTION

- Tamarisk and Arundo are not your everyday weeds: the diabolical duo


pollution
15 7 2002

Invasive Weeds are Nation wide

- Tamarisk (Tamarix) up to 1 million acres
- Arundo donax: up to .5 million acres
- Yellow Starthistle: 15 million acres in CA
- Perennial Pepperweed (Whitetop)
- Purple Loosestrife: early identification and eradication
- Revenna Grass: spreading in CC watershed

Saltcedar has become a pest for many reasons.

- Naturalized in many riparian areas of the west
- Spreading rapidly and becoming more dense
- Hybridized across species
- Displacing desired plant species
- Altering habitats which affects other associated plants and animals (several now threatened and endangered species affected)
- Disrupting water flow, accelerating erosion, increasing fire hazard, etc.
- Expansion partially linked with hydrology changes

Conservancy Partners

- 43 OF 45 LANDOWNERS ALONG 12 Mi
- YOLO COUNTY
- YOLO COUNTY WATER DIST.
- STATE WILDLIFE CONSERVATION Bd
- CALFED'S WATERSHED PROGRAM
- USDA-ARS: RESEARCH / BIOCONTROL
- FARMERS AND RANCHERS
- BLM, American Land Conservancy
- Rumsey Band of Wintun Indians


JOHN DEERE

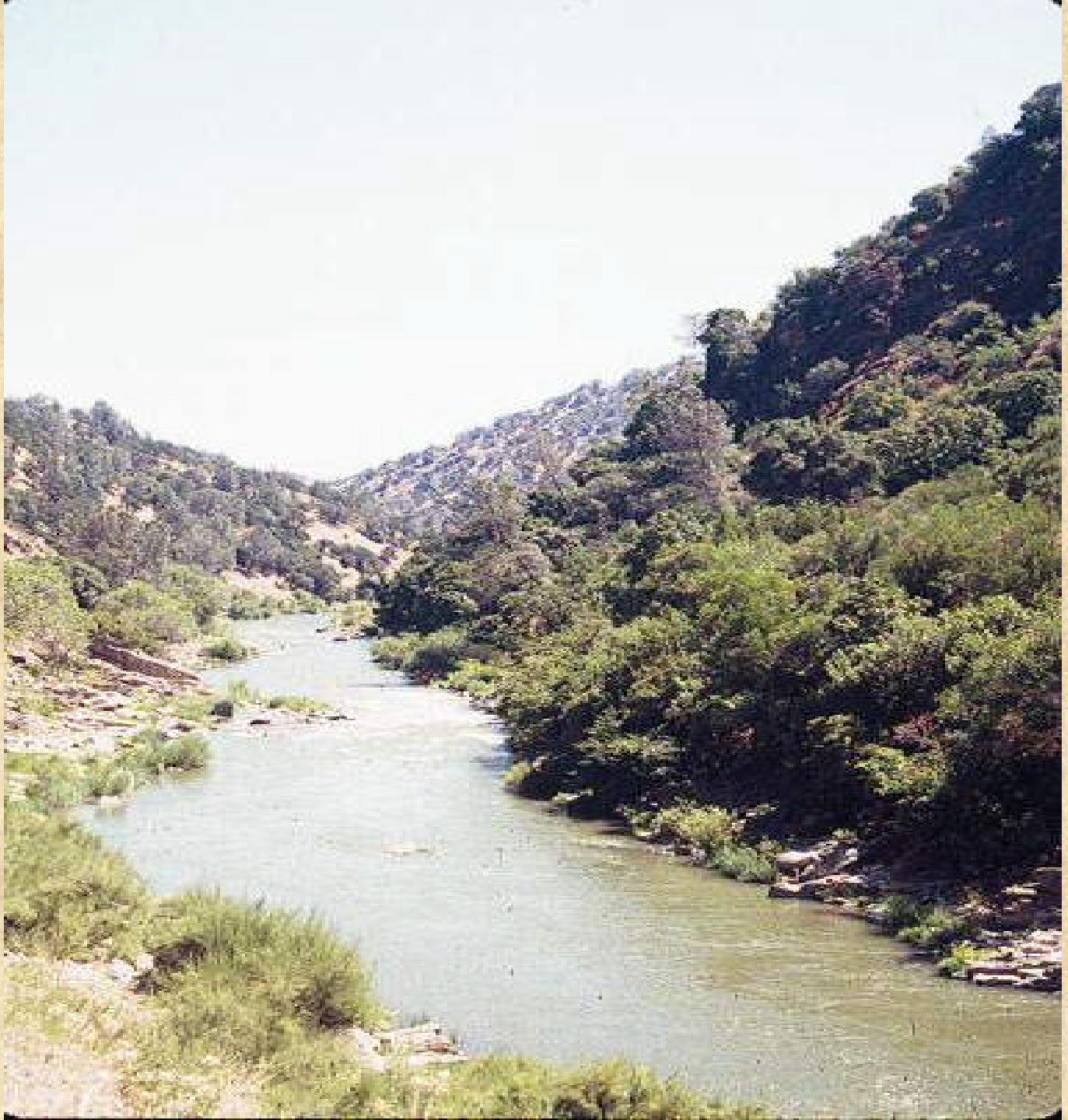
Project Funding

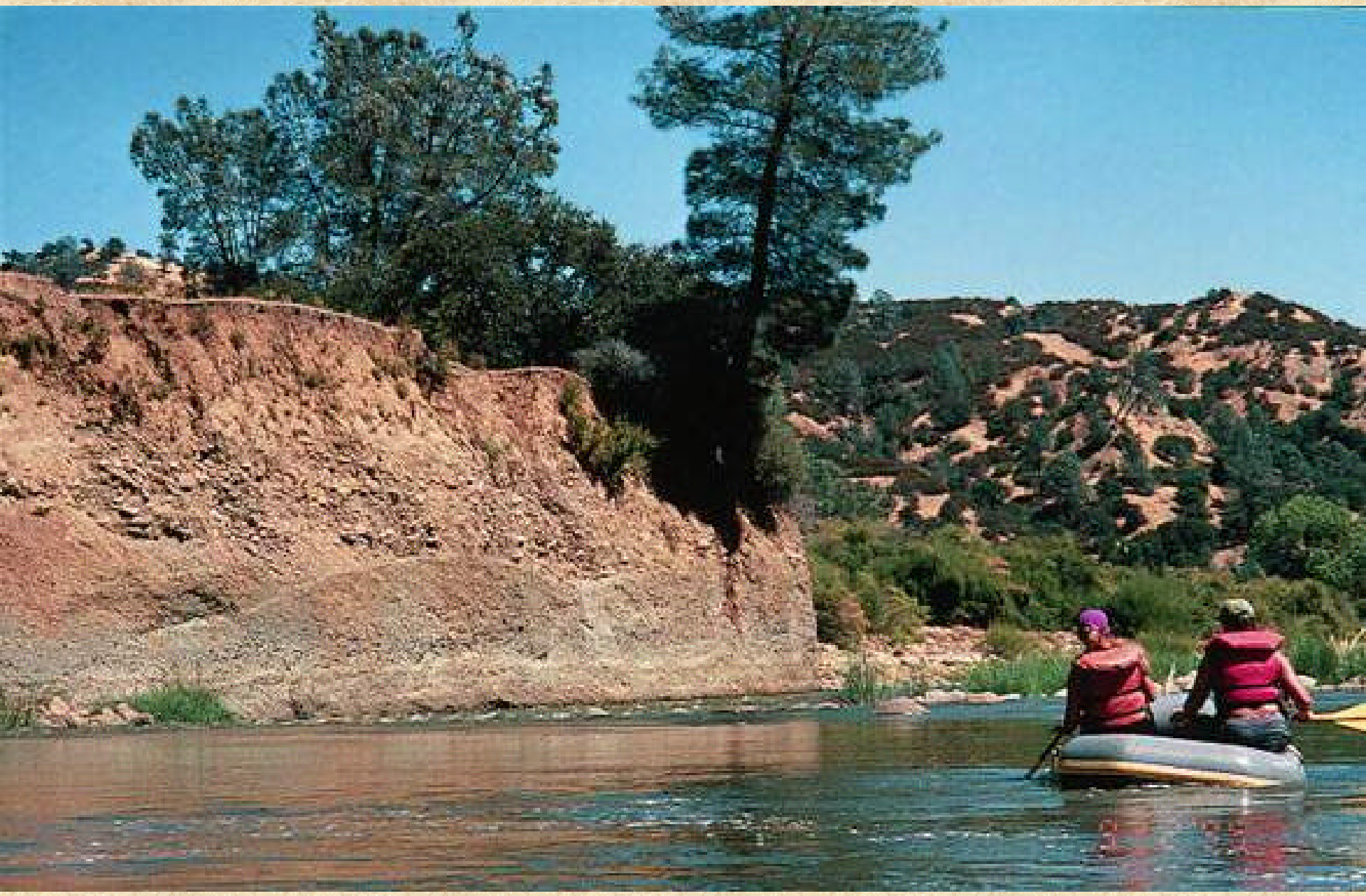
- WILDLIFE CONSERVATION Bd: $595k
- CALFED (CBDA) : $222,000
- YC FLOOD CONTROL: $30,000
- YOLO COUNTY: $150K inkind monitoring
- USDA-ARS: $1M in research/biocontrol
- CACHE CREEK CONSERVANCY:$10k

MANAGING NPS POLLUTION

- Mercury is a major impairment to water quality in Cache Creek.
- Sediment moves mercury through the watershed
- Tamarisk and Arundo cause erosion which drastically increases sedimentation
- Managing Tamarisk and Arundo will decrease NPS pollution in our watershed

Valley
Colusa
Nevada City
Truckee
Ukiah
Yuba City
Marysville
Grass Valley
COAST RANGES
Lakeport
Clear
POINT ARENA
Cloverdale
Auburn
Lincoln
Roseville
American
Placerville
Folsom
Healdsburg
Woodland
Santa Rosa
Sacramento
Sebastopol
Jackson
Napa
Petaluma
Vallejo
Benicia
San Pablo Bay
Lodi
San Andreas
38°
POINT REYES
San Rafael
Richmond
Pittsburg
Angels Camp
MUIR WOODS NATL. MON.
Berkeley
Stockton
Sonora
Sausalito
Oakland
New Melones Res.
San Francisco
Alameda
Oakdale
Daly City
Tracy
Livermore
Aqueduct
Burlingame
San Mateo
Modesto
Tuolumne
Redwood City
Turlock
Palo Alto
Merced
Santa Clara
San Jose
Los Gatos
California
Santa Cruz
Gilroy
P
A





Conservancy's Management Strategy

- Integrated Pest Management approach: use all available tools and expertise:
- 1. hand removal around native vegetation
- 2. mechanical removal with chopper for large areas.
- 3. chemical control with specific herbicide applications: best materials, correct timing, correct application technique.
- 3. biocontrol as long-term management tool throughout the Cache Creek watershed.


CAT


CAT


CAT
CATERPILLAR
CAT

Motorized Application


Organic
Application

Project Goals

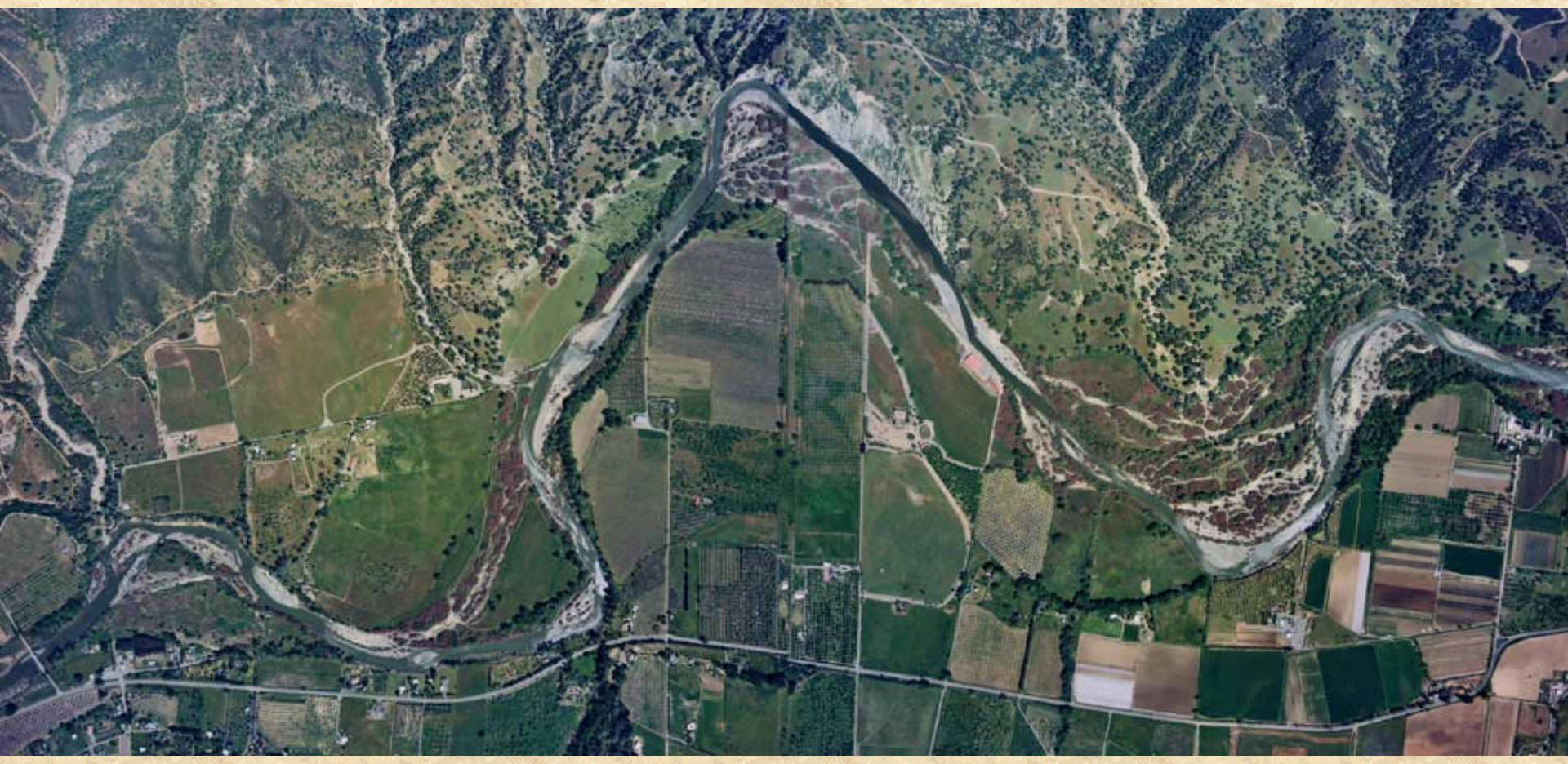
- Successfully control Tamarisk and Arundo in a 300 acre corridor along 12 miles of lower Cache Creek, at a cost of $850,000 or $2,800 (+/-) per acre.
- Accomplish this control corridor within 5 year funding window.
- Continue monitoring and spot control of resprout or seedlings for total of 10 years.

Accomplishments to Date

- Since Oct. 2001 start, we have treated 900 acres (3 times original project size), at an average per acre cost of $850 per acre.
- Revised and perfected herbicide concentrations, application techniques and timing which = increased efficacy.
- Attracted upstream partners to expand project with new infusion of funding.

Tamarix Map of Cache Creek in 2001 (II)

1000 0 1000 2000 Meters



Biological Control of Saltcedar

The use of remote sensing to assess biological control impact.

Ray Carruthers[1], Jeff Knight[2] and Gerry Anderson[3]

[1] USDA-ARS, Albany, CA

[2] Nevada Department of Agriculture, Reno, NV

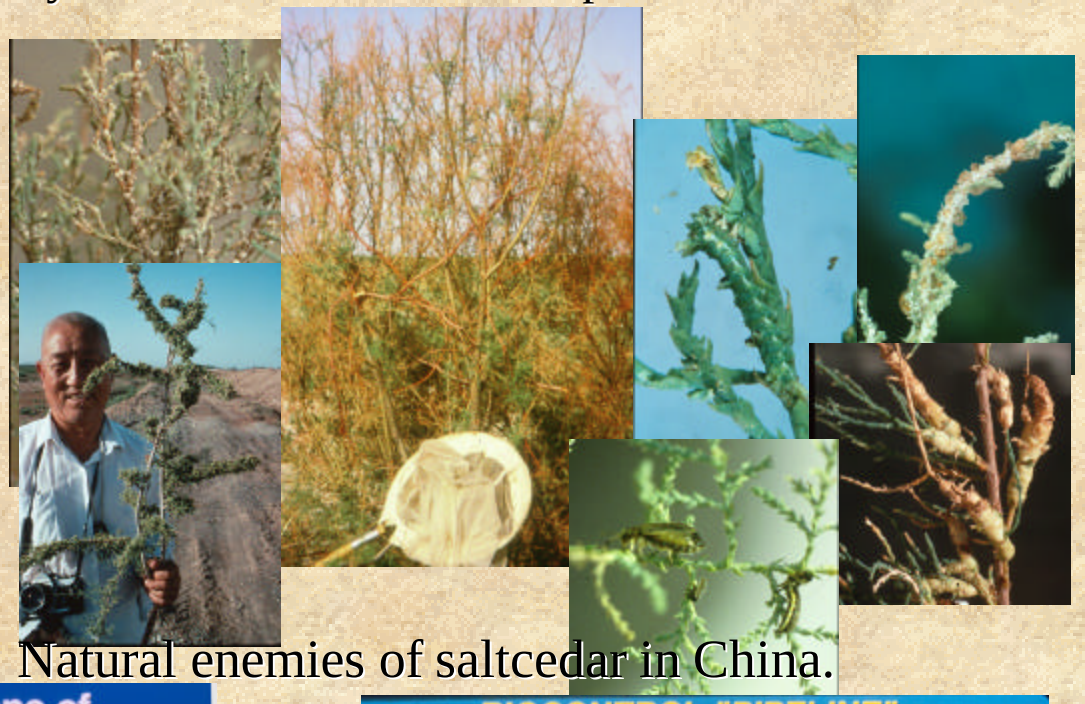
[3] USDA-ARS, Sidney, MT

Natural Control is one of the main reasons saltcedar is not a pest in Eurasia

- Saltcedar is attacked by over 350 different insects in its natural habitat
- Many of these insects only eat saltcedar
- They die rather than feed on almost anything else
- These are the insects that we use for biocontrol

What is biological control?

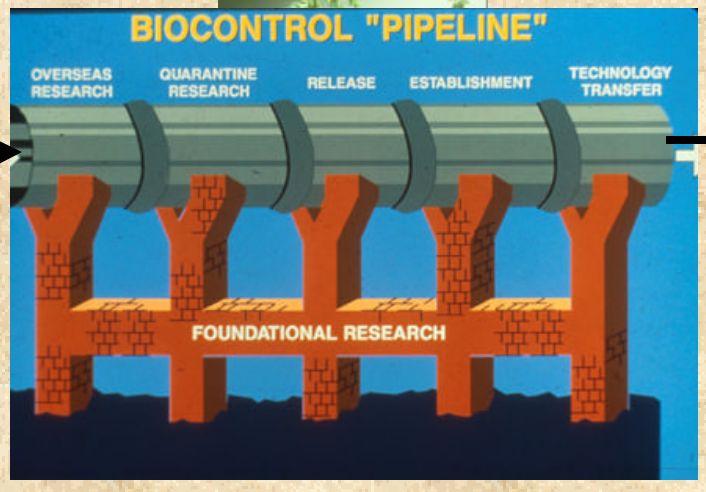
Biological control uses insects that feed on the pest in its native land. After safety testing they are used to feed on those plants here.



Natural enemies of saltcedar in China.

It has been used effectively 1000s of times all around the world.

USDA began using biocontrol in the late 1800s



and has used this method to control many insect and weed pests.

ARS is implementing biocontrol of saltcedar with many cooperators

-A new biocontrol agent

-*Diorhabda* beetles from Eurasia

-Tested in field cages for several years

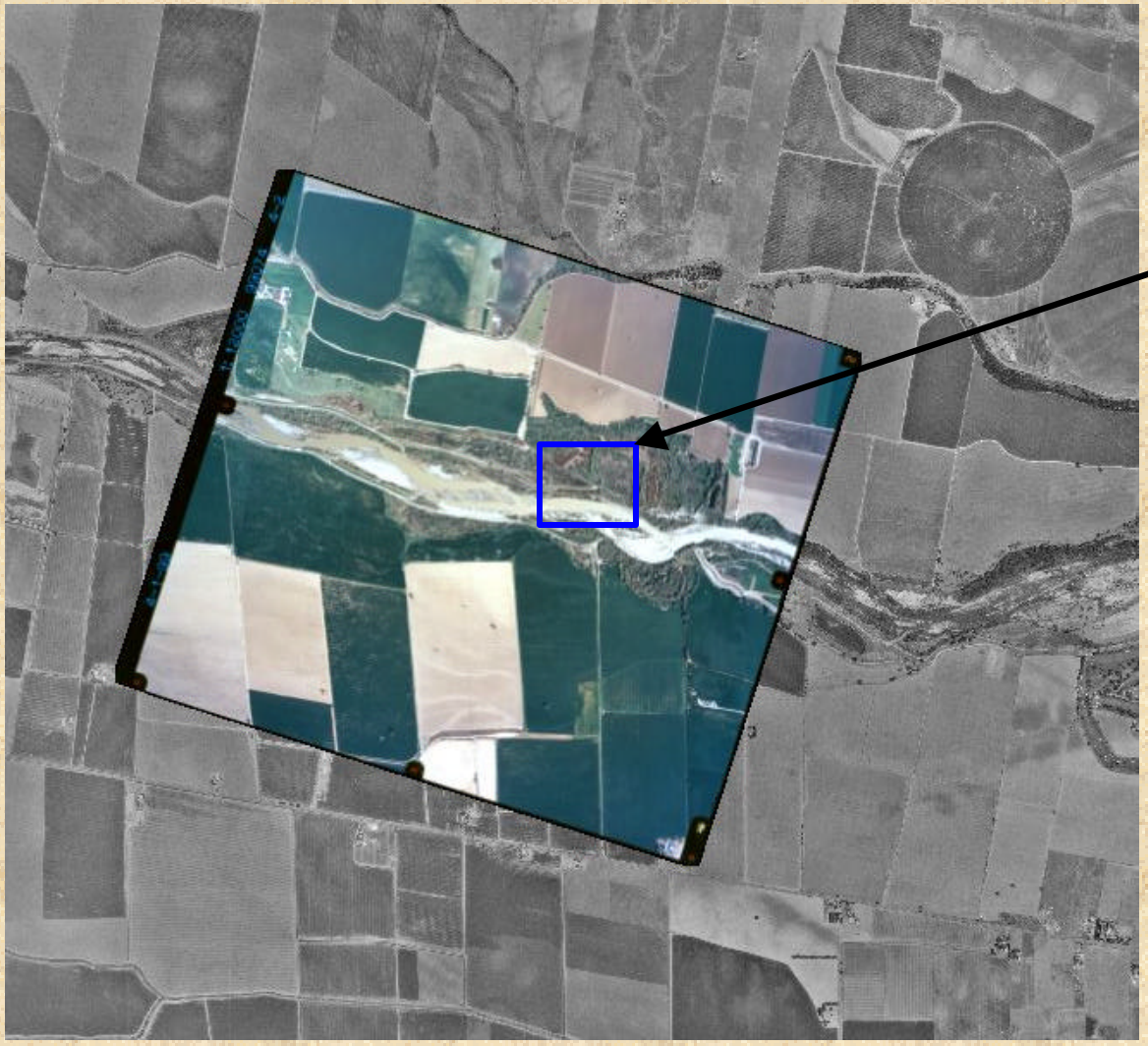
-Years of quarantine safety testing

-First open field releases in were in spring/ summer of 2001 in six states

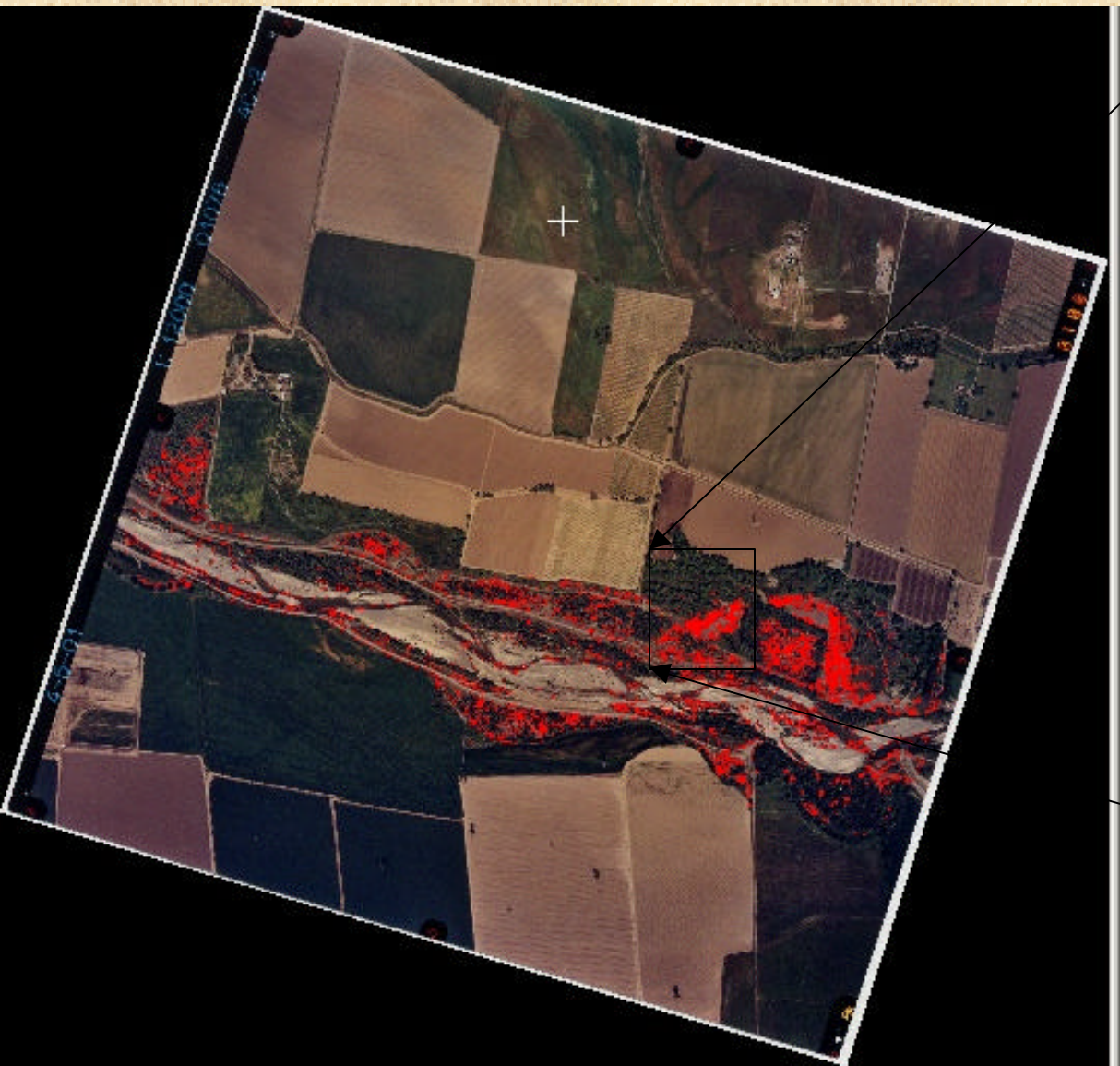
Lovelock, Nevada provided best results to date.

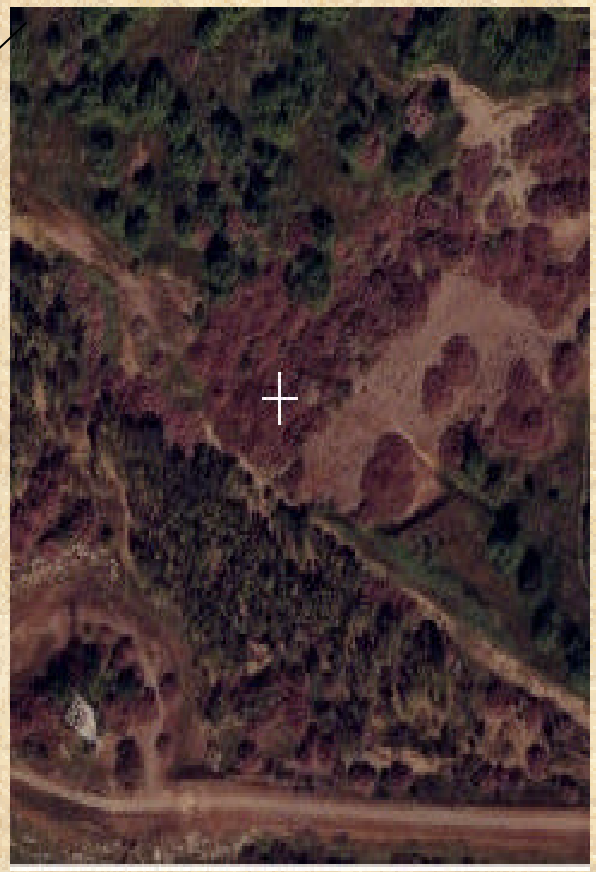
Use of remote Sensing and GIS Technologies

Geo-referenced aerial photo layered on a USGS Digital Ortho Quad (DOQ)

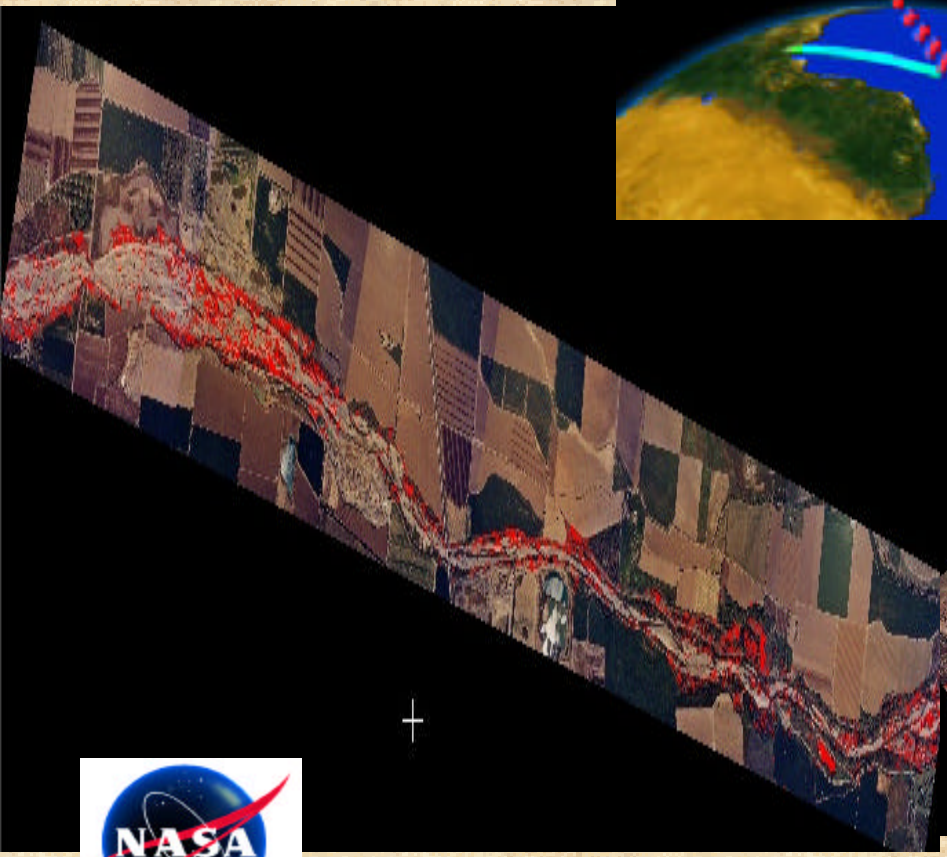


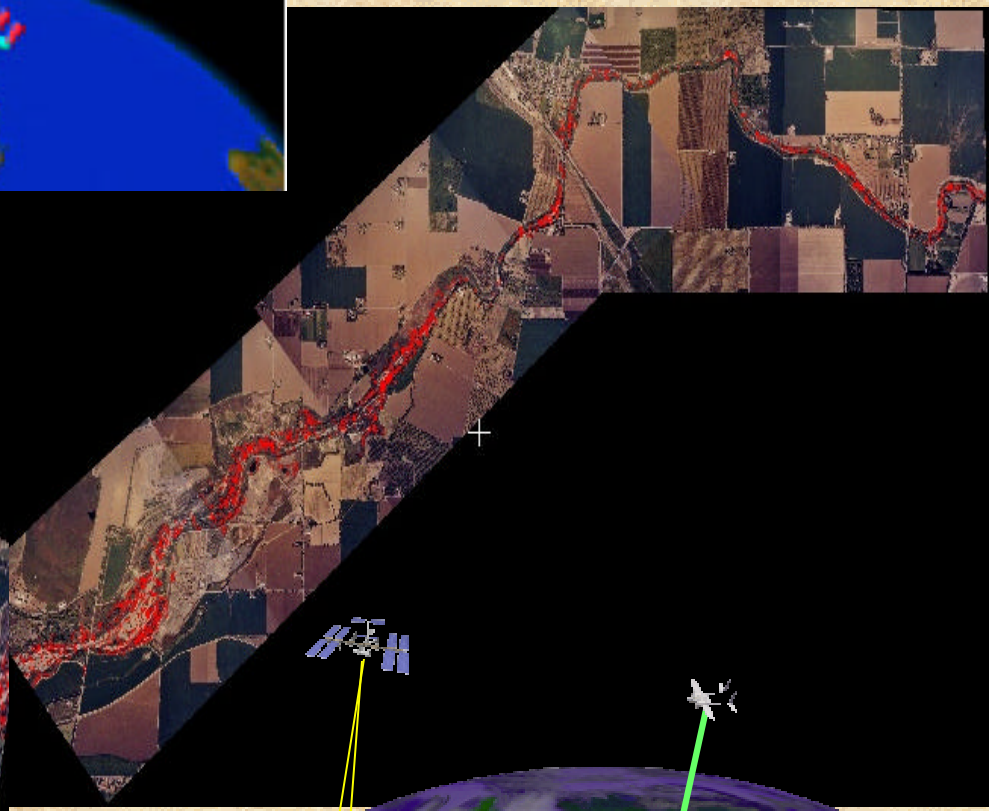
Comparison of a Photo with mapped *Tamarix* Cover





New Cooperation with NASA

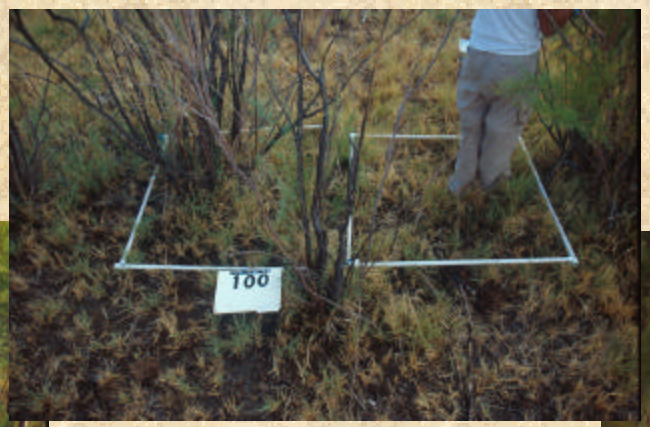




USDA-NASA Project Plans

- Preliminary Research Plans Under Development
- Objectives
  - Invasive Species risk assessment
  - Habitat Characterization
  - Invasive Species Identification and Spread
  - Ecosystem Impact Evaluation
  - Management Decision Support/ Validation
  - Management Evaluation/ Validation
  - Recovery Evaluation/ Validation
  - Overall Integrated Vegetation Management and Decision Making
- ARS NPS selected target weeds based on consultation with EIWRU and NASA
  - Saltcedar/ Arundo complex
  - Yellow Starthistle/ forage grasses
  - Pinion Pine/ Juniper habitat expansion
  - Aquatic weed yet to be determined (Egeria densa/ water hyacinth)

For More Information See The Project Websites



www.wrrc.usda.gov

wric.ucdavis.exotic/exotic/saltcedar

Cache Creek Nature Preserve

Environmental Education


Cache Creek Conservancy
Restoration - Education - Outreach